

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A preparation of non-inbred mouse embryonic stem (ES) cells that comprise alleles derived from at least three different inbred mouse strains, wherein the ES cells have good developmental potential.
2. The non-inbred ES cell preparation according to claim 1, wherein the ES cells additionally comprise a transgene docking site.
3. A preparation of non-inbred mouse embryonic stem (ES) cells that comprise alleles derived from at least two different inbred mouse strains and a transgene docking site, wherein the ES cells have good developmental potential.
4. The non-inbred ES cell preparation according to claim 2 or 3, wherein the transgene docking site is a deletion mutant of an X-linked hypoxanthine phosphoribosyltransferase (HPRT) gene.
5. The non-inbred ES cell preparation according to claim 2 or 3, wherein the transgene docking site comprises a *loxP* site.
6. The non-inbred ES cell preparation according to any one of claims 1 – 5, wherein chimeras derived from the ES cells exhibit greater than 50% ES cell contribution.
7. The non-inbred ES cell preparation according to claim 6, wherein chimeras derived from the ES cells exhibit greater than 90% ES cell contribution.
8. The non-inbred ES cell preparation according to claim 7, wherein chimeras derived from the ES cells exhibit about 100% ES cell contribution.
9. A method for producing an ES cell-derived mouse comprising the steps of:
  - (a) introducing a non-inbred mouse ES cell preparation according to any one of claims 1 - 7 into a mouse blastocyst under conditions that result in production of at least one embryo;
  - (b) transferring the resulting embryo(s) into an appropriate foster mother; and

- (c) maintaining the foster mother under conditions that result in development of live offspring.

10. A method for producing a transgenic mouse comprising the steps of:

- (a) introducing one or more transgenic sequences into non-inbred mouse ES cells of an ES cell preparation according to any one of claims 2 or 4 - 7;
- (b) maintaining the ES cells under conditions that result in homologous recombination at the transgene docking site such that the one or more transgenic sequences are incorporated in the genome of the ES cells;
- (c) introducing the resultant recombinant ES cells into blastocyst(s), under conditions that result in production of at least one embryo; transferring the resulting embryo(s) into an appropriate foster mother; and
- (d) maintaining the foster mother under conditions that result in development of live offspring, wherein the ES cells have good developmental potential.

11. The method according to claim 9 or 10, wherein the appropriate foster mother is, a pseudopregnant female mouse.

12. An ES cell-derived mouse that is prepared according to the method of claim 9 or 11.

13. A transgenic mouse that is prepared according to the method of claim 10 or 11.

14. A method for preparing mouse embryonic stem cells having good developmental potential that comprises the steps of:

- (a) mating a female mouse of a first inbred mouse strain with a male mouse of a second inbred mouse strain, wherein the first and the second mouse strains are different;
- (b) performing multiple generations of breeding including a combination of crosses and backcrosses from offspring obtained from the mating between the female mouse and the male mouse in step (a);

- (c) recovering blastocysts from a mouse obtained following the multiple generations of breeding performed in step (b).

15. A method for preparing mouse embryonic stem cells having good developmental potential that comprises the steps of:

- (a) mating a female mouse of a first inbred mouse strain with a male mouse of a second inbred mouse strain, wherein the first and the second mouse strains are different;
- (b) mating an offspring of the mating of step (a) with a mouse of a third inbred mouse strain;
- (c) performing multiple generations of breeding including a combination of crosses and backcrosses from offspring obtained from the mating between of step (b);
- (d) recovering blastocysts from a mouse obtained following the multiple generations of breeding performed in step (c).

16. The method according to claim 14 or 15, wherein the multiple generations of breeding comprises a combination of 5 or 6 crosses and backcrosses.

17. The method according to any one of claims 14 – 16, wherein at least one on the inbred mouse strains contains a transgene docking site.

18. The method according to claim 17, wherein the transgene docking site is a deletion mutant of an X-linked hypoxanthine phosphoribosyltransferase (HPRT) gene.

19. The method according to claim 17, wherein the transgene docking site comprises a *loxP* site.

20. A non-inbred embryonic stem (ES) cell preparation obtained by the method of any one of claims 14 – 19.

21. Use of the ES cell preparation according to any one of claims 1 – 8 or 20 for producing an ES cell derived mouse.

22. Use of the ES cell preparation according to any one of claims 1 – 8 or 20 for producing an ES cell derived transgenic mouse.